LAWRENCE LIVERMORE
REPORT

A weekly review of scientific and technological achievements from Lawrence Livermore National Laboratory, Feb. 7-11, 2011

Take cover

The Lab's Morgan Burks holds a radiation detector.

If an improvised nuclear device, or IND, goes off in a large metropolitan area like Los Angeles, is there any chance of survival?

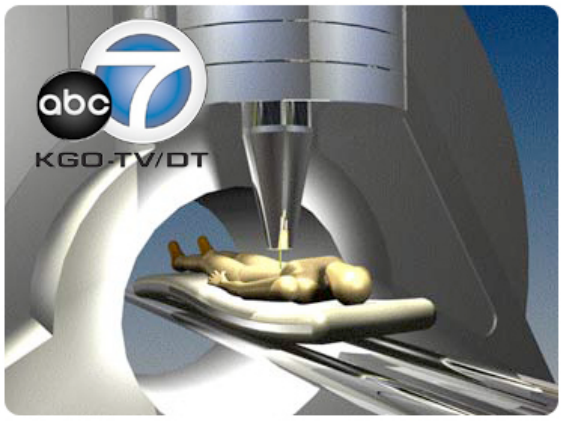
Yes, says the Lab's Brooke Buddemeier. As long as people take cover, preferably in the center of a building or parking garage, for 12-24 hours they can protect themselves from nuclear fallout.

CNN recently featured a story on the Lab's layered defense approach to fighting terrorism and personal protection in the event of an improvised nuclear device.

Global Security's Parney Albright also was interviewed about his perspective on such a scenario taking place.

To see the video, go here.

Proton therapy closer to treating cancer



Compact proton radiotherapy treatment concept. Illustration by Steven Hawkins

Compact Particle Acceleration Corporation (CPAC), which licensed a revolutionary proton therapy technology from the Laboratory, this week demonstrated proton acceleration with its compact particle accelerator technology.

Proton therapy is a new technology that can be used to treat cancer.

CPAC's accelerator is a highly compact system based on the dielectric-wall accelerator (DWA) technology developed by the Laboratory. It is expected that CPAC's proton accelerator will be capable of accelerating protons to more than 150 megaelectron volts and will cost less, be substantially smaller and offer clinicians greater flexibility than traditional proton accelerators.

Most cancer treatments have been done with X-rays, which are successful in destroying tumors but can damage healthy tissue around the tumor. In contrast, protons deposit their energy near the end of their path and have little lateral scatter. As a result, the beam energy can be precisely delivered to the tumor without seriously harming surrounding tissues or adjacent critical organs.

To listen to a story about the technology, go to the Web.

A supercomputer coming to a town near you

Next year's Top 500 list of the world's most powerful supercomputer will list systems capable of performing calculations as much as eight times faster than the fastest computers available today.

And No. 1 on that list is likely to be the 20-petaflop (floating operations per second) Lawrence Livermore supercomputer aptly named Sequoia, which is set to be operational in 2012.

IBM is on target to build the machine that will be housed at the Lab's Terasacale Simulation Facility.

IBM also has deals for a 10-petaflop system in the Argonne National Laboratory near Chicago and another in the University of Illinois at Urbana-Champaign

To read more, go to the Web.

Saving lives becomes robotic

Chico student Jason Coates demonstrates the controls for a robotic vehicle.

Laboratory scientists have enlisted a group of engineering students at Chico State University to create a life-saving tool aimed at helping troops in Afghanistan.

Improvised explosive devices, or IEDs, pose a constant risk to troops, but now the Chico engineering students have created a remote control vehicle that could search for IEDs and at the same time reduce the risk of troop injuries and deaths. IEDs rip apart cars and rarely leave survivors.

The team created portable consoles that will allow soldiers to send a car into dangerous situations by remote control. The vehicle has wide-angle cameras in the front and sides so the operator can see the terrain while remotely directing the vehicle from a safe distance. All the electronics and wiring are items that came off a store shelf, making maintenance quite simple.

And the cost: about $50,000.

To see a video, go to the Web.

It's gust about time

Jeff Mirocha and Sonia Wharton, LLNL scientists, and teacher Christine Tyler, will present "It's Gust About Time: Harnessing the Wind for Our Future Energy Needs" this Saturday, Feb. 12, as part of the Lab's popular Science on Saturday program.

Congressman Jerry McNerney, a former wind energy engineer, will address the audience at the start of the first session at 9:30 a.m. A second session starts at 11:15 a.m.

The Tri Valley portion of the series, presented by LLNL's Science Education Program, is held at the Bankhead Theater, 2400 First St. in Livermore for free.

Science on Saturday is a series of science lectures for middle and high school students. Each topic highlights cutting-edge science occurring at Laboratory. The talks are presented by leading LLNL science researchers supported by master high school science teachers. These presentations are offered in several locations.

LLNL applies and advances science and technology to help ensure national security and global stability. Through multi-disciplinary research and development, with particular expertise in high-energy-density physics, laser science, high-performance computing and science/engineering at the nanometer/subpicosecond scale, LLNL innovations improve security, meet energy and environmental needs and strengthen U.S. economic competitiveness. The Laboratory also partners with other research institutions, universities and industry to bring the full weight of the nation's science and technology community to bear on solving problems of national importance.
To send input to the Livermore Lab Report, send e-mail mailto:labreport@llnl.gov.
The Livermore Lab Report archive is available on the Web.